

Applicant: Ebersole et al.

For: Internetworked Augmented Reality System and Method

1. An internetworked augmented reality (AR) system, comprising:
 - a. At least one Local Station, at least one of which must be a Local AR Station,
 - b. At least one Remote Station, and
 - c. A network connecting these stations.
2. The system of claim 1 wherein an AR Station is comprised of at least:
 - a. A computing system
 - b. An AR display system, and
 - c. A tracking system
3. The system of claim 1 wherein a Non-AR Station is comprised of at least:
 - a. A computing system
4. The system of claim 1 wherein the network is selected from the group of networks consisting of a local area network (LAN), a wide area network (WAN), a wireless network, and the Internet.
5. The system of claim 3 wherein a Non-AR Station computing system is selected from the group of computing systems consisting of a PC, web server, database server, and high-performance computer (HPC).
6. The system of claim 3 wherein there is equipment allowing a human to use at least one Station in addition to the required Local AR Station.
7. The system of claim 5 wherein an AR Station user can remotely interact with a HPC that performs computationally intensive calculations.

8. The system of claim 5 wherein an AR Station user can perform shopping online by downloading items from a web server for placement, evaluation, and interaction in the user's own environment.
9. The system of claim 5 wherein an AR Station user is aided in maintenance tasks by accessing information from a remote database server.
10. The system of claim 5 wherein an AR Station user is aided in design tasks by accessing information from a remote database computer.
11. The system of claim 1 further including means to capture video from an AR Station and transmit it over a network to another Station.
12. The system of claim 6 wherein an AR Station user is a trainee/student and another Station user is an instructor/teacher.
13. The system of claim 6 wherein an AR Station user can collaborate with another user.
14. The system of claim 6 wherein a user at another Station can control the experience at an AR Station via an input device.
15. The system of claim 6 wherein a user at another Station can observe the experience at an AR Station via a live video feed.
16. The system of claim 6 wherein a user at another Station can communicate with a person at an AR Station by voice via audio feed(s).
17. The system of claim 6 wherein a user at another Station can visually communicate with an AR Station user via graphical overlays in the field of view of the AR Station user.
18. The system of claim 5 wherein an AR Station user is aided in navigation by accessing frequently updated information over a network.

19. The system of claim 6 wherein a user at another Station controls a testing program at an AR Station.
20. The system of claim 5 wherein an AR Station user is aided in situational awareness (SA) by accessing frequently updated information over a network.
21. The system of claim 6 wherein an AR Station user can play a game with at least one other user at another Station.
22. The system of claim 15 wherein at least one live video feed is from the first person perspective as seen by an AR Station user.
23. The system of claim 15 wherein at least one live video feed is from a non-first-person perspective camera.
24. The system of claim 23 wherein a live video feed is from at least one movable camera controllable remotely from a Station user.
25. The system of claim 6 wherein a user at a Station can view from any viewpoint a virtual representation of an AR scenario, which includes virtual representations of an AR Station user or users.
26. The system of claim 25 wherein a user at a Station can select a virtual representation of an AR Station user to read information about that particular user.
27. The system of claim 6 wherein a user at a Station can observe the effects of a stimulus which results in an AR Station user perceiving sounds from objects in AR.
28. The system of claim 6 wherein a user at a Station can observe the effects of a stimulus which results in an AR Station user perceiving forces or surface textures (haptic feedback) from objects in AR.

29. The system of claim 6 wherein a user at a Station can observe the effects of a stimulus which results in an AR Station user perceiving smell from objects in AR.
30. The system of claim 6 wherein a user at a Station can observe the effects of a stimulus which results in an AR Station user perceiving heat and cold from objects in AR.
31. The system of claim 6 wherein a user at a Station can observe the effects of a stimulus which results in an AR Station user perceiving electrical shock from objects in AR.
32. The system of claim 2 wherein the effects onto and from real objects of reflections, shadows, and light emissions from virtual objects downloaded from a web server are seen by an AR Station user.
33. The system of claim 3 wherein an AR Station user can augment telepresence imagery with virtual imagery by adding a video camera and image capture capability to a Non-AR Station to capture and send video back to an AR Station for viewing by the user.
34. The system of claim 33 wherein a motion tracking system at an AR station controls a mechanized camera mount at a Non-AR Station.
35. The system of claim 33 wherein a video camera is stationary and aimed at a reflective curved surface, and the video image received at the AR Station is mapped to the inside of a virtual curved surface for undistorted viewing of the camera scene.
36. The system of claim 2 further including at least one video camera.
37. The system of claim 2 further including at least one input device.
38. The system of claim 3 further including at least one input device.
39. The system of claim 5 wherein an AR Station user is aided in design tasks by accessing information from a remote HPC (high performance computer).

40. The system of claim 6 wherein a user at a Station can visually communicate with an AR Station user via text overlays in the field of view of the AR Station user.
41. The system of claim 25 wherein a user at a Station can select a virtual representation of an AR Station user to send information to that particular user.
42. The system of claim 6 wherein a user at a Station can control a stimulus which results in an AR Station user perceiving sounds from objects in AR.
43. The system of claim 6 wherein a user at a Station can control a stimulus which results in an AR Station user perceiving forces or surface textures (haptic feedback) from objects in AR.
44. The system of claim 6 wherein a user at a Station can control a stimulus which results in an AR Station user perceiving smell from objects in AR.
45. The system of claim 6 wherein a user at a Station can control a stimulus which results in an AR Station user perceiving heat and cold from objects in AR.
46. The system of claim 6 wherein a user at a Station can control a stimulus which results in an AR Station user perceiving electrical shock from objects in AR.